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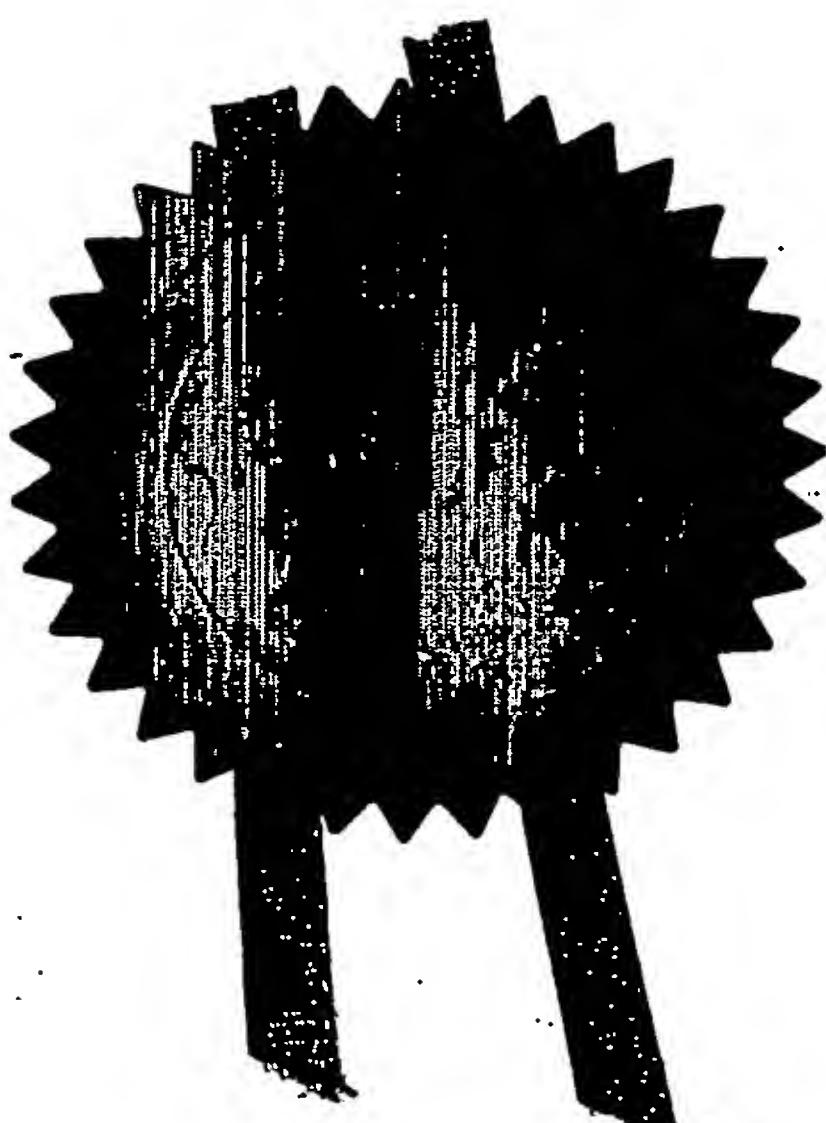
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Cubicle

This invention relates to a temporary cubicle which can be readily erected and subsequently disassembled, and also to a vehicle incorporating a temporary cubicle.

There are, in the U.K., approximately 120,000 people who suffer from an illness known as Irritable Bowel Disease (IBD). Common to such sufferers is the need to visit a toilet frequently and urgently. Whilst schemes exist to provide wider access to toilets through special key arrangements etc., the provision of public toilets is, in practice, very inadequate.

Moreover, in the wider context of healthy people, there can arise situations where the availability of an emergency toilet would be beneficial, particularly where children or elderly people are involved. Such situations might arise when visiting remote beauty spots where there are no toilets, in long tailbacks on motorways, vehicle breakdowns or as a result of temporary illnesses. Finally, the cubicle alone of such an emergency toilet could be of use to swimmers, surfers, etc. who need to change in a public place.

An object of the invention is to provide a temporary cubicle, and also a vehicle incorporating same, in a convenient and effective manner.

According to a first aspect of the invention there is provided a vehicle having attached to a part thereof a temporary cubicle device which is normally in a first, stowed state in or on the vehicle, but which upon

manipulation by a user can assume an assembled state in which at least a part thereof is at the exterior of the vehicle.

In one embodiment, the vehicle is of hatchback form and the device is normally stowed in the boot thereof in its first state. Opening of the rear door or tailgate of the hatchback vehicle automatically at least partly assembles the device. Preferably the device incorporates an upper support frame which, when said rear door or tailgate is fully open, can be manually lifted to lie horizontal. Conveniently said frame defines the shape of the assembled cubicle and in one embodiment it is square or rectangular. Depending from the frame is non-transparent material, and advantageously said material extends, in use, to the ground when the cubicle is fully assembled/erected. The support frame is held horizontal by a spring and catch mechanism. In its assembled state, the material of the cubicle has a zipped or 'Velcro' (RTM) opening to allow access into the cubicle. Desirably a toilet seat is attached to a floor of the vehicle boot, and more desirably the toilet seat can be moved from a first stowed position where it is wholly received in the boot, to a second, in use, position where it is within the assembled cubicle. The seat can pivot from its first to its second state.

In a second embodiment, the device is normally stowed on the roof of the vehicle in its first state. Preferably it is mounted in the manner of a conventional roof rack. The stowed device may be locked against unauthorised operation. The device incorporates a linkage allowing a main upper canopy part thereof to be drawn forwards and upwards to a position where it lies at the exterior of one side of the vehicle. Preferably when the device is pulled from its stowed state it moves over top dead centre, so that

when the canopy part is at the exterior of said one side of the vehicle, it is in a stable, horizontal position. Desirably with the canopy part in this position, operation of a catch releases from the underside of the canopy part a lower side part of the device, which depends from the canopy part of said side of the vehicle. Conveniently a toilet seat is stowed at said lower side part.

Once the canopy part and lower side parts of the device are positioned as described above, non-transparent material attached to the canopy part can be released from its folded state so as to depend therefrom to reach the ground, preferably in the manner of lowering a window blind. Access to the now assembled cubicle device is via a zipped or 'Velcro' (RTM) opening in the material.

According to a second aspect of the invention there is provided a temporary cubicle device comprising a foldable support frame having attached to part thereof foldable non-transparent material, the support frame and material being movable between a first, folded state for stowage of the device, and a second, unfolded state in which the unfolded support frame defines at least part of the shape of the cubicle device in its assemble state in which said material is unfolded.

Preferably the support frame includes a linkage having a pair of support arms to which said material is attached. Desirably when said support frame is unfolded, the support arms are automatically moved to lie normal to a main part of the support frame.

Conveniently the assembled cubicle device is square or rectangular, with a pair of opposite sides thereof being formed by said material depending

from said support arms which are horizontal, in use, parallel and spaced apart. The material is conveniently of waterproof material, such as tent fabric. It can be fitted with a double-sided zip or 'Velcro' (RTM) and is preferably washable. The top and bottom of the cubicle device, in use, is advantageously fitted with respective disposable covers held in place with press studs or the like. The upper cover may be translucent to provide light to the cubicle device, and keeps rain off a user of the cubicle device. The lower cover provides an 'anchor' weight to steady the device in winds, and it also allows a user's feet and clothes to be kept clean and dry if the device is used in wet or muddy conditions. Once dirty, the lower cover, or groundsheet, can be disposed of and a new one readily fitted.

Whilst the cubicle device can be free-standing, it can be supported by a structure, preferably a vehicle. In such a case, the support frame preferably includes means for temporary engagement with the structure. Where the structure is a vehicle, the support frame desirably includes one or both of a stabilising arm for engaging the vehicle roof and a suction cup for engaging the vehicle window. Conveniently the support frame includes two spaced stabilising arms, each of which is adapted mechanically to engage a vehicle roof 'well' or a vehicle roof bar. Desirably each stabilising arm has its end rotatable to select a magnetic engagement means instead. Moreover the stabilising arms could be replaced by a main roof suction unit, for example, instead of a magnetic fixing, for aluminium bodies.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a cubicle device of one aspect of the invention,

Figure 2 is a perspective view of a vehicle of another aspect of the invention with a cubicle device thereof partly assembled,

Figure 3 is a view like Figure 2, showing a toilet seat stowed in the vehicle,

Figure 4 is a view like Figure 2, showing the cubicle device assembled,

Figure 5 is a view like Figure 3, but with the cubicle device assembled and the toilet seat in its 'in use' position,

Figure 6 is a perspective view of another embodiment of a vehicle of said another aspect of the invention,

Figure 7 is a view like Figure 6 showing the cubicle device partly assembled,

Figure 8 is a view like Figure 7, showing a toilet seat in position for full assembly of the cubicle device,

Figure 9 is a view like Figure 8, but showing the cubicle device fully assembled,

Figure 10 is a view like Figure 9, but showing the interior of the assembled cubicle device,

Figure 11 is perspective view of a support frame of the cubicle device in its folded state,

Figure 12 is a rear perspective view of an assembled cubicle device with its support frame unfolded,

Figure 13 is a view like Figure 12 from one side,

Figure 14 is a view of part of a linkage of the support frame of Figure 11,

Figures 15 to 17 are respective views of the engagement of a support arm of the support frame with a vehicle roof,

Figures 18 and 19 are perspective views of respective opposite sides of the assembled cubicle device of Figures 12 and 13 temporarily attached to a vehicle,

Figure 20 is a view like Figure 19, showing part of the assembled cubicle device cut away to show a toilet seat therein,

Figure 21 is a view like Figure 18, but showing different means of attaching the cubicle device to the vehicle roof,

Figure 22 is a detail of the different attachment means of Figure 21,

Figure 23 is a perspective view of a toilet seat for use in a cubicle device of the invention, in its folded state,

Figure 24 shows the seat of Figure 25 in its unfolded state, and

Figure 25 is a schematic side view showing a waste bag used with the seat of Figure 24.

Although, as will be described hereinafter, the present invention has particular applicability in the provision of a cubicle device to provide a portable toilet facility, the invention is not limited thereto, and includes within its scope, a temporary cubicle device in general.

To this end Figure 1 shows the general construction of such a cubicle 10 in its assembled, i.e. unfolded, state. Typically the assembled cubicle device 10 would be of square or rectangular shape, for example 650mm X 700mm in cross-section and 1850mm high to enable most people to carry out the required actions comfortably. The cubicle device will generally be made of a light, waterproof, easily foldable material, such as a tent fabric. It

would, in one embodiment, be fitted with a double-sided zip and be washable. An important feature of the cubicle device is that it must be of a construction which allows it to be erected/assembled very quickly, for example within less than one minute.

The cubicle device shown in Figure 1 is fitted with an upper disposable plastic cover 11, and a lower disposable plastic cover 12, each being held in place with press-studs 13 or the like. In the embodiment shown, the upper cover is translucent to allow light into the cubicle, and this cover also keeps the rain off a user and out of the cubicle device. The lower cover 12 provides two important functions. Firstly whether used as a portable toilet, or merely as a cubicle, for example for changing clothes, the user's feet and clothes can be kept clean and dry if the unit is used in wet or muddy conditions. Later a dirty or soiled 'groundsheet' can be disposed of and a new one quickly fitted. Secondly when the cubicle is used as a portable toilet, the lower cover allows both the toilet itself and the user to provide an 'anchor' weight to steady the unit in any winds.

The actual toilet unit itself does not form part of the present invention, and a user can supply his or her own, or make use of the lightweight, foldable unit if this is supplied with the cubicle device. This will be referred to in respect of Figures 23 to 25 hereinafter. It is envisaged that the unit supplied with the cubicle device will make use of biodegradable plastic bags made of maize starch or similar.

The embodiment of the invention shown in Figures 2 to 5 is one version of a portable toilet which is permanently attached to a vehicle 14.

In this embodiment the vehicle 14 is of hatchback form, and as will be described, the cubicle device, when not in use, is stowed in the boot of the vehicle, this constituting a first state of the cubicle device. In this embodiment, part of the cubicle device 15 is thus permanently attached to a part of the vehicle and relative to the further embodiment to be described in relation to Figures 6 to 10 is the fastest to set up, in use. It is thus appropriate for more frequent use than the later option to be described.

As shown in Figures 2 to 5, the cubicle device 15 is formed with an upper square or rectangular support frame 16 from which material 17 of the cubicle device depends, the material being attached to the frame 16 in any convenient manner. As shown best in Figures 2 and 4, material at the rear of the cubicle is attached to the vehicle within its boot, and the material at respective opposite sides of the cubicle device is shaped so as to extend over the rear bumper of the vehicle and then to the ground, in its assembled state, at the outside of the rear of the vehicle. Part of the support frame 16 adjacent the interior of the rear door or tailgate of the vehicle is attached thereto by any convenient pivot means 18.

As shown in Figure 3, included in this embodiment of the cubicle device is a toilet seat 19 which is permanently mounted to the floor of the vehicle boot, this providing a firm anchor for the structure. The toilet seat can be used with any suitable receptacle, for example a biodegradable plastic bag as mentioned above. As shown in Figure 5, this seat can be pivoted, i.e. opened out, after the cubicle device has been fully assembled, so that it lies within the cubicle exteriorly of the vehicle to enable the toilet to be used.

Accordingly with reference to Figures 2 to 5, it can be seen that when the rear door or tailgate of the vehicle 14 is opened and lifted up, folded material 17 of the cubicle device 15 is drawn out of the boot. Once the rear door or hatchback is fully open, the support frame 16 will have been lifted, in the direction of the arrow shown in Figure 2, to the position shown in Figure 3. The support frame 16 is then moved to the horizontal position shown in Figure 4, in which it is held by a spring and catch mechanism, or by any other suitable means. This movement of the frame to the horizontal position further unfolds the material 17 secured to the frame 16, so that the fully assembled state of the cubicle device 15 is then reached as shown in Figure 4 with the material depending from the support frame 16 defining a completely closed cubicle.

As mentioned above, it is intended with this embodiment that after the cubicle has been fully assembled/erected, the toilet seat 19 is opened out in the direction of the arrow shown in Figure 5 so that it is positioned within part of the cubicle device which is situated outside of the vehicle.

Access to the cubicle device is via a suitable opening 20 in the front or one side of the material of the cubicle device 15. As shown in Figure 4, the opening 20 is in one side of the assembled cubicle device 15. The opening can be provided with a zip, or can be released and secured by the use of 'Velcro' (RTM). As described with the cubicle device of Figure 1, the cubicle device 15 can have disposable plastic sheets fitted at the top and bottom thereof respectively, these being attached by press-studs or any

similar means. Thus as stated above, these sheets can be changed after use in muddy conditions.

The embodiment of the invention shown in Figures 6 to 10 is a variation on that shown in Figures 2 to 5, in that although the cubicle device 21 is still associated with a vehicle, it is now mounted, when stowed, on the roof of the vehicle, as shown in Figure 6, instead of being stowed in the boot thereof. Thus here the vehicle could be other than one with a hatchback, i.e. a conventional four door booted vehicle. This version of a car toilet shown in Figures 6 to 10 may be used when a more permanent version is required, but where the owner of the vehicle wants to retain full use of the boot. Although erection of the cubicle device 21 may take more time than erection of the cubicle device 15, in the first embodiment, it is believed that it would be quicker than the 'stick-on' version to be described hereinafter in relation to Figures 18 to 22.

In the embodiment shown in Figures 6 to 10, the stowed cubicle device 21 is mounted on the roof of the vehicle in substantially the same manner as for a normal car roof rack. The exact manner of fixing will depend upon the roof design of the vehicle in question. The stowed device 21 may incorporate the mechanism enabling it to be locked and kept so when not in use. In one embodiment access to the lock will normally be on the driver's side.

As shown in Figures 6 and 7, the cubicle device 21 incorporates an upper square or rectangular canopy 22, to which is hinged a lower side part 23. As shown best in Figure 7, the canopy 22 is fixed by a linkage 24 at

respective opposite sides thereof to respective spaced rails 25 fixed on the vehicle roof. A catch (not shown) secures the canopy 22 to the lower side part 23. Each of these components of the cubicle device 21 has some depth, so that, as shown in Figure 7, it is possible to stow between these two components in their closed state shown in Figure 6, a folded toilet seat 26, this, for example, being held fixed to the interior of the side part 23 by any suitable fixing means.

Accordingly by pulling the closed assembly of the canopy 22 and lower side part 23 in the direction of the arrow shown in Figure 6, this assembly can be drawn forwards and upwards to a suitable position. This pulling causes the assembly to go over 'top dead centre' and then to stop in a stable position. When the catch mentioned above between the canopy 22 and lower side part 23 is released, the lower portion 23 can be opened to gain access to the folded seat 26, with this side part 23 lying at the side of the vehicle, depending from the horizontal canopy which extends outwardly at the exterior of the side of the vehicle.

As shown in Figure 8, it is possible, once the lower side part 23 has been released from the canopy 22, to remove the folded toilet seat 26, and then to unfold it and position it below the canopy 22 so that it is in place, at least approximately, for when the cubicle device 21 is fully assembled. Its fully assembled state is that shown in Figures 9 and 10, and to achieve this state, the cubicle device material, which has been folded, for example, into the canopy 22, is released to assume the shape shown in Figure 9, depending from the canopy shape 22, in the manner of lowering a window blind. When the Figure 9 state is reached, the cubicle device 21 is then ready for use. As

with the first embodiment, access to the cubicle device 21 via, for example, a side thereof, is via a zipped or 'Velcro' (RTM) opening (not shown). Again the base of the cubicle device may be fitted with a disposable plastic sheet, which may be changed after use in muddy conditions. The material 27 of the cubicle device would generally be the same as that described in relation the cubicle device shown in Figure 1.

The embodiment of the invention shown in Figures 18 to 22 is one where there is no permanent attachment of the cubicle device 28 to a vehicle 29, but only a temporary attachment. Accordingly this version of the car toilet has the most general application for 'emergency' use. Whilst it can be set up reasonably quickly, it is intended as a method of last resort.

The cubicle device 28 here includes a support frame 30 which is used not only to temporarily attach the cubicle device to a vehicle, but also provides the main structure of the cubicle device and defines the shape thereof. The support frame, which is shown in Figure 11, for clarity, without the attached material of the cubicle device, comprises a pair of main arms 31, 32 which are pivoted together at their respective lower ends, at which a suction pad 33 is disposed. Approximately half-way along their length, the arms are provided with pivotally connected stabilising arms 34, 35 respectively, at the end of which are respective means for engagement with a vehicle roof, as will be described in detail in relation to Figures 15 to 17.

At the ends of the main arms remote from the suction pad 33 are respective brackets 36, 37, at which respective support bars 38, 39 are pivoted, these bars carrying the material 40 of the cubicle device 28.

As shown in Figures 11 and 14, an unfolding or opening of the support frame 30 causes the support bars 38, 39 to move from their folded position shown in Figure 11, where they lie in close proximity to the main arms 31, 32, to a position shown in Figures 12 and 13 where they have pivoted through 90° from their folded position to lie, in use, horizontal, and normal to the plane of the remainder of the frame 30. From Figure 14 it can be seen that this pivoting is effected by means of linkage rods 41, 42 respectively which themselves are connected from the brackets 36, 37 to respective links 43, 44 which have one of their respective ends at the main arms 31, 32 and are pivoted together at their respective other ends by a pivot 45.

The support frame 30 folds to a compact size, and is arranged to facilitate the folding with it of the material 40 of the cubicle device 28, so that the support frame 30 and material 40 can be folded to a compact size and, for example, stowed in a manageable sized carrying bag. The support frame 30 is very light, for example weighing approximately 1500g. The support frame is constructed so that when the main arms 31, 32 are pulled apart in the direction of the arrows shown in Figure 11, the frame work opens fully, as shown in Figure 12, to support the canopy, with the support bars 38, 39 which carry the material 40 moving to their spaced, parallel, horizontal position shown in Figure 12 so that the material assumes the square or rectangular shape defined by said bars. In practice, it is generally

necessary for a user of the device manually to unfold the material 40 from around the support frame to assemble the cubicle device into its Figure 12 state, the support frame being held during this operation by the person setting up the cubicle device.

As shown in Figures 18 to 20, it is intended that in one embodiment of the invention the assembled cubicle device 28 is temporarily attached to a vehicle, and this can be effected in various ways. In the embodiment illustrated, each of the stabilising arms is provided at its free end with means for engaging the vehicle roof. Figure 15 shows a projection 46 engaged in a 'well' 47 of the vehicle roof, whilst Figure 16 shows the projection 46 engaged with a roof bar 48 of the vehicle. As can be seen from Figures 15 to 17, the end of each stabilising arm can be adjustable, for example by way of a telescopic arrangement, so that the extreme separate end of each arm can be rotated to make use of a magnet 49 instead of the projection 46. Accordingly Figure 17 shows the alternative fixing means at the end of the stabilising arm. The magnet 49 would normally be strong and is mounted so that it can 'float' and so adjust to any roof angle. Clearly this is only applicable to cars with steel roofs, and, as will be described, an alternative fixing is required for temporary attachment of the cubicle device to an aluminium roof.

Figures 18 and 19 show the cubicle device 28 set up in its working position. The stabilising arm magnets 49 provide a grip on the roof of the vehicle 29, whilst the suction pad 33 anchors the support frame 30 to a rear side window of the vehicle. In Figure 20, the cubicle device 28 is cut away to show the normal position of a toilet seat 50 used within the cubicle device

28. It will be appreciated that this set-up could equally be provided at the opposite side of the vehicle.

If a magnetic attachment is not possible, for example where the body to which the cubicle device is to be temporarily attached is of aluminium, the magnets 49 can be replaced with a single main suction unit 51 shown in Figure 21, and in greater detail in Figure 22. Here it could be arranged that the support frame is supported by respective rubber pads, one of which 52, is shown in Figure 21. Given that the cubicle device when incorporating the unit 51 is somewhat different from cubicle device 28, it will be noted that in Figures 21 and 22, the cubicle device has been denoted by the numeral 28a.

With regard to the embodiments described and shown where the cubicle device is permanently attached to the vehicle, it will be understood that in either case the cubicle device could be retro-fitted to an existing vehicle.

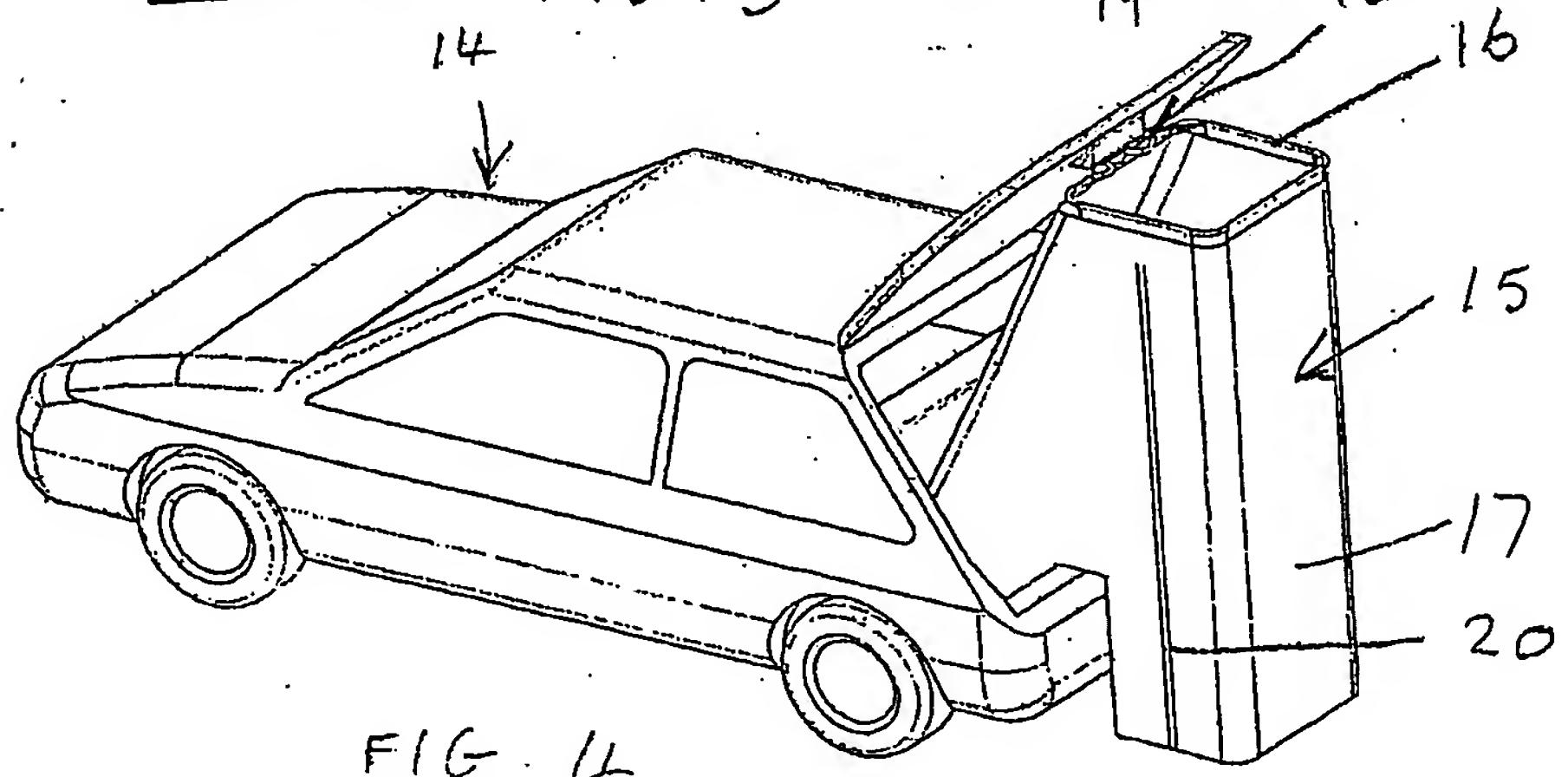
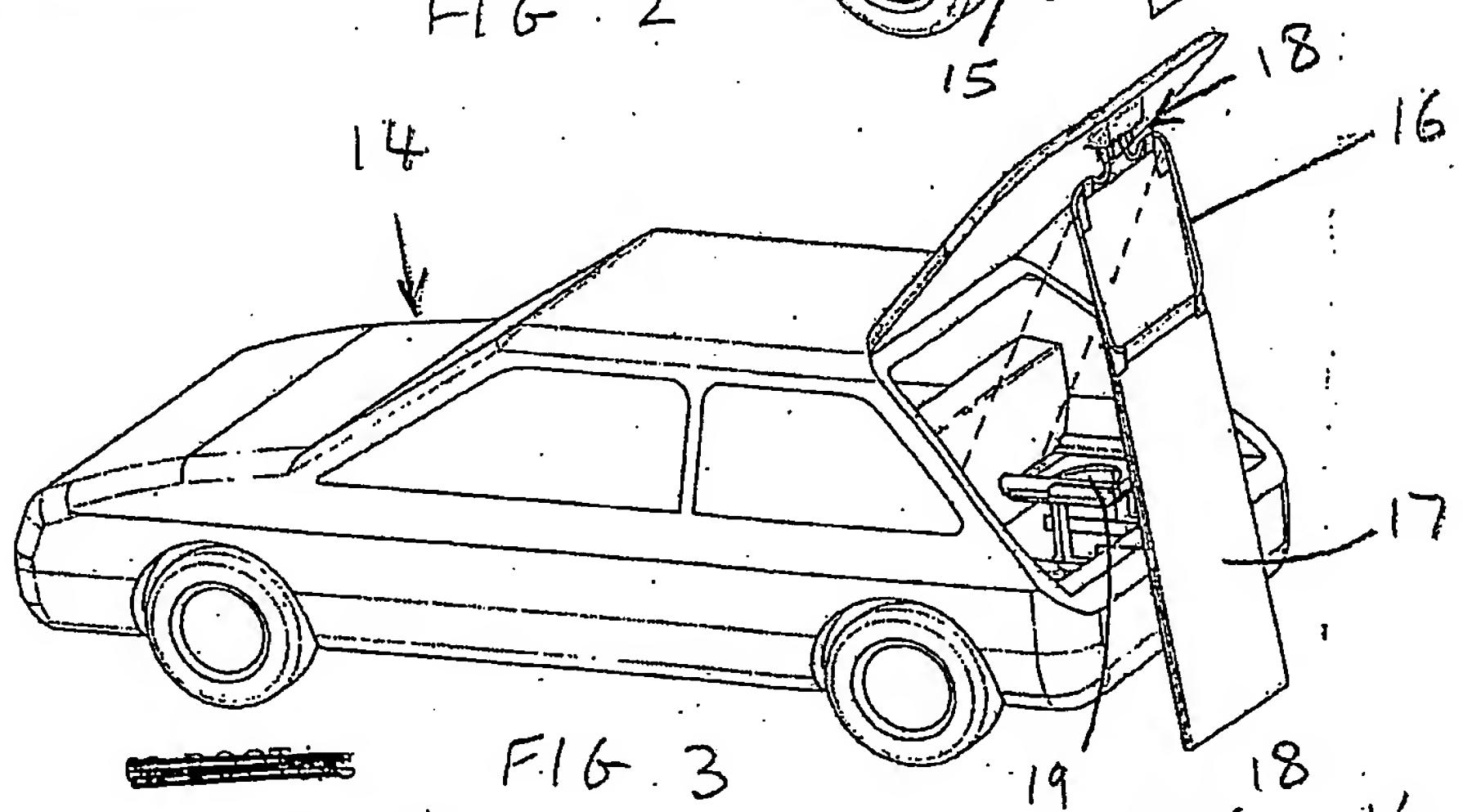
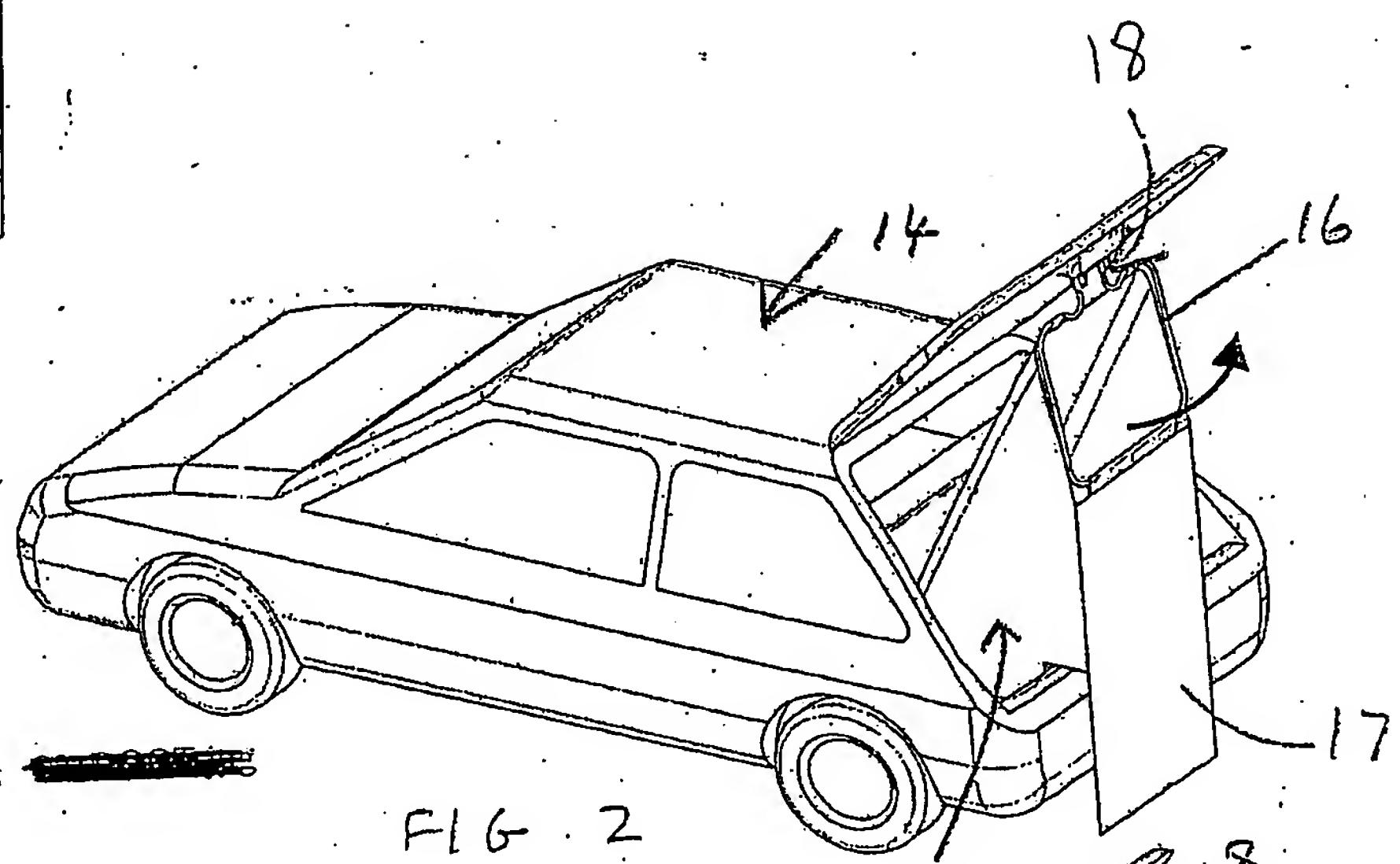
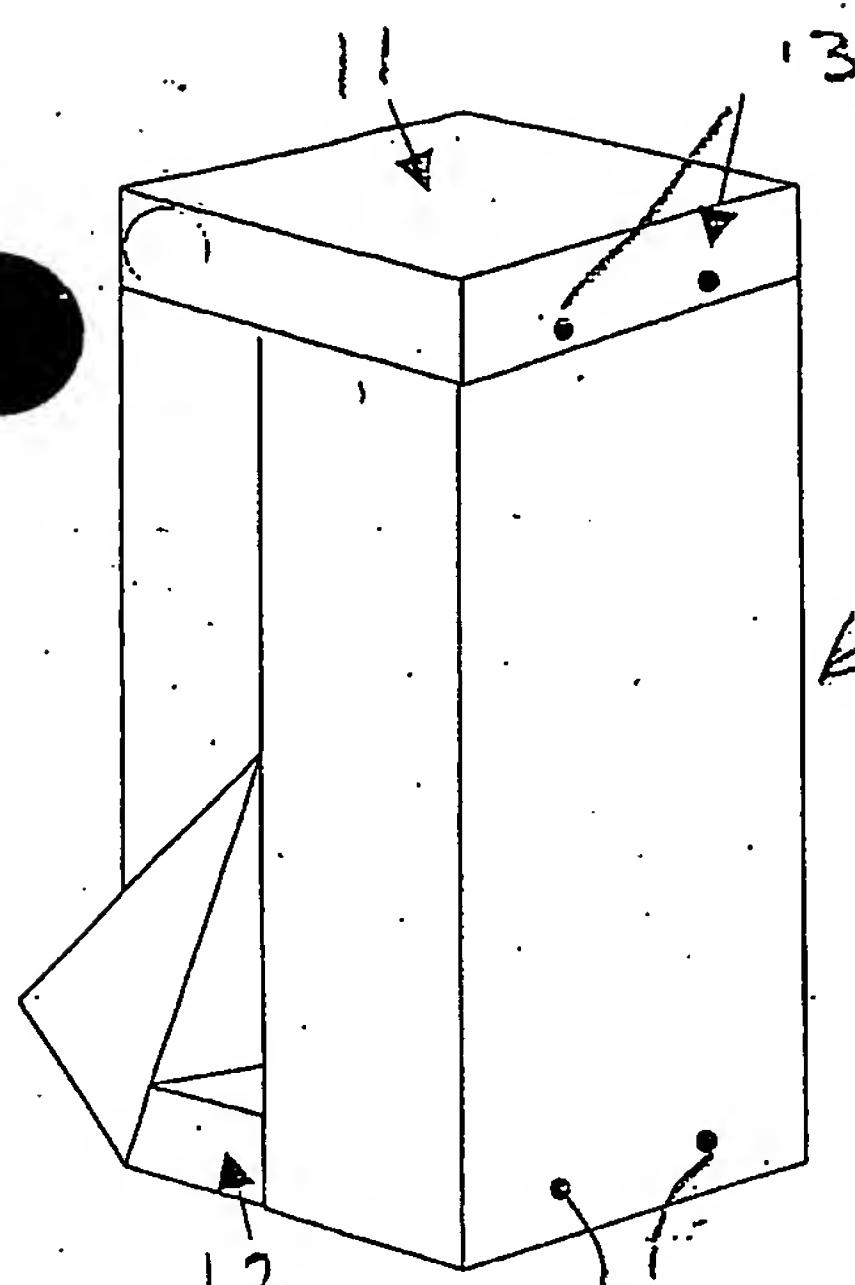
With the arrangement where the cubicle device is only temporarily attached to a vehicle or other structure, the window pad anchors the structure in place, whilst the two stabilising arms act as supports. However alternatively it will be possible to support entirely off the roof of the vehicle or from the side thereof. Where a suction pad or suction cup is used, this can be arranged to be angled to suit the glass of the vehicle accordingly. With regard to the roof-mounted embodiment, it is envisaged that it may be possible to arrange for this to be remotely controlled, for example for a wheelchair user, so that on operation of a remote controlled unit the stages in

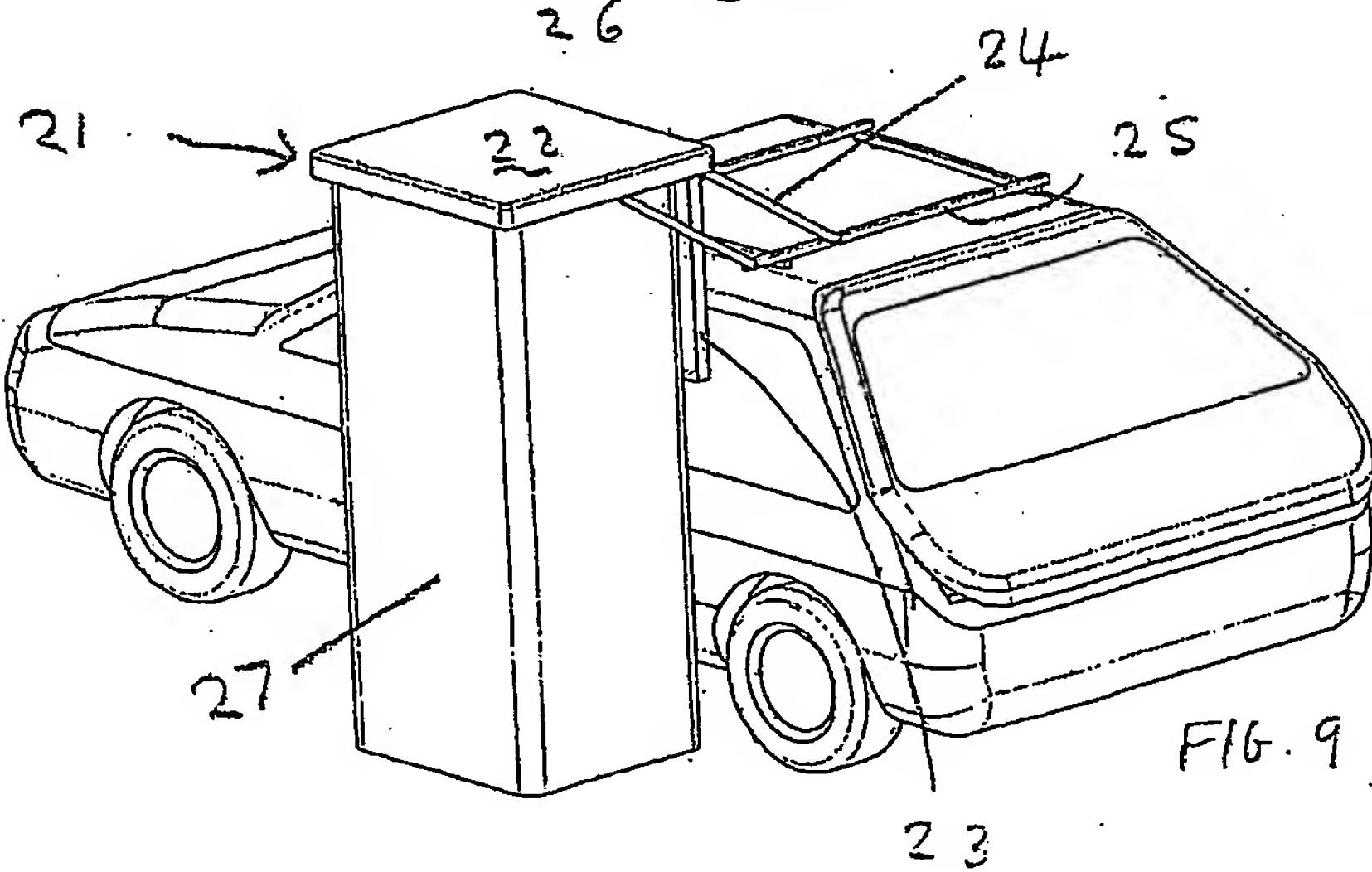
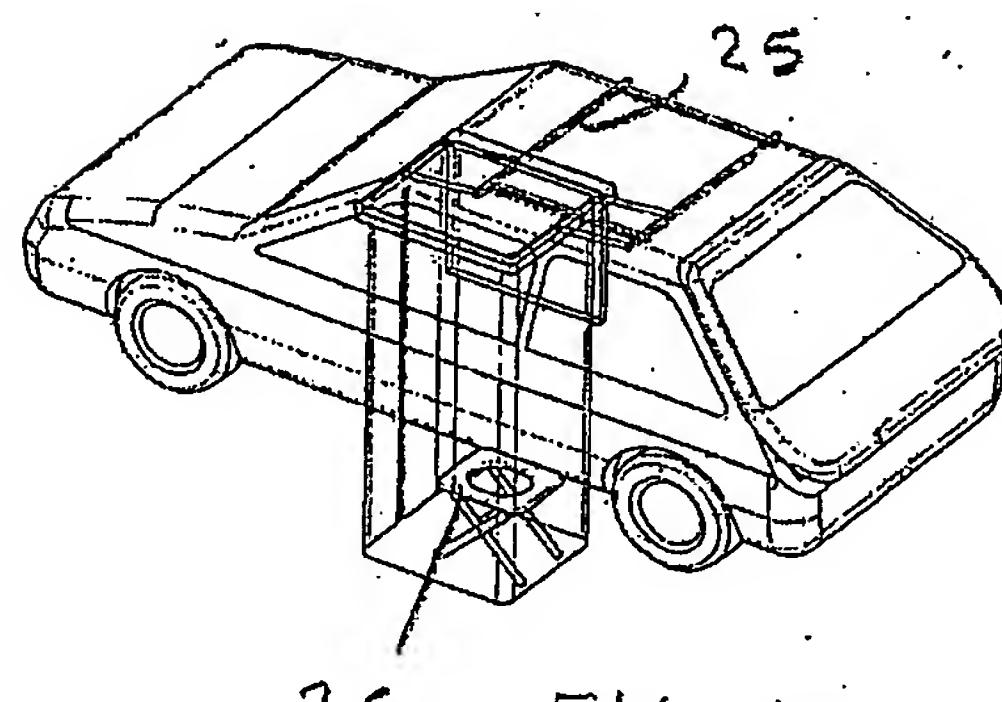
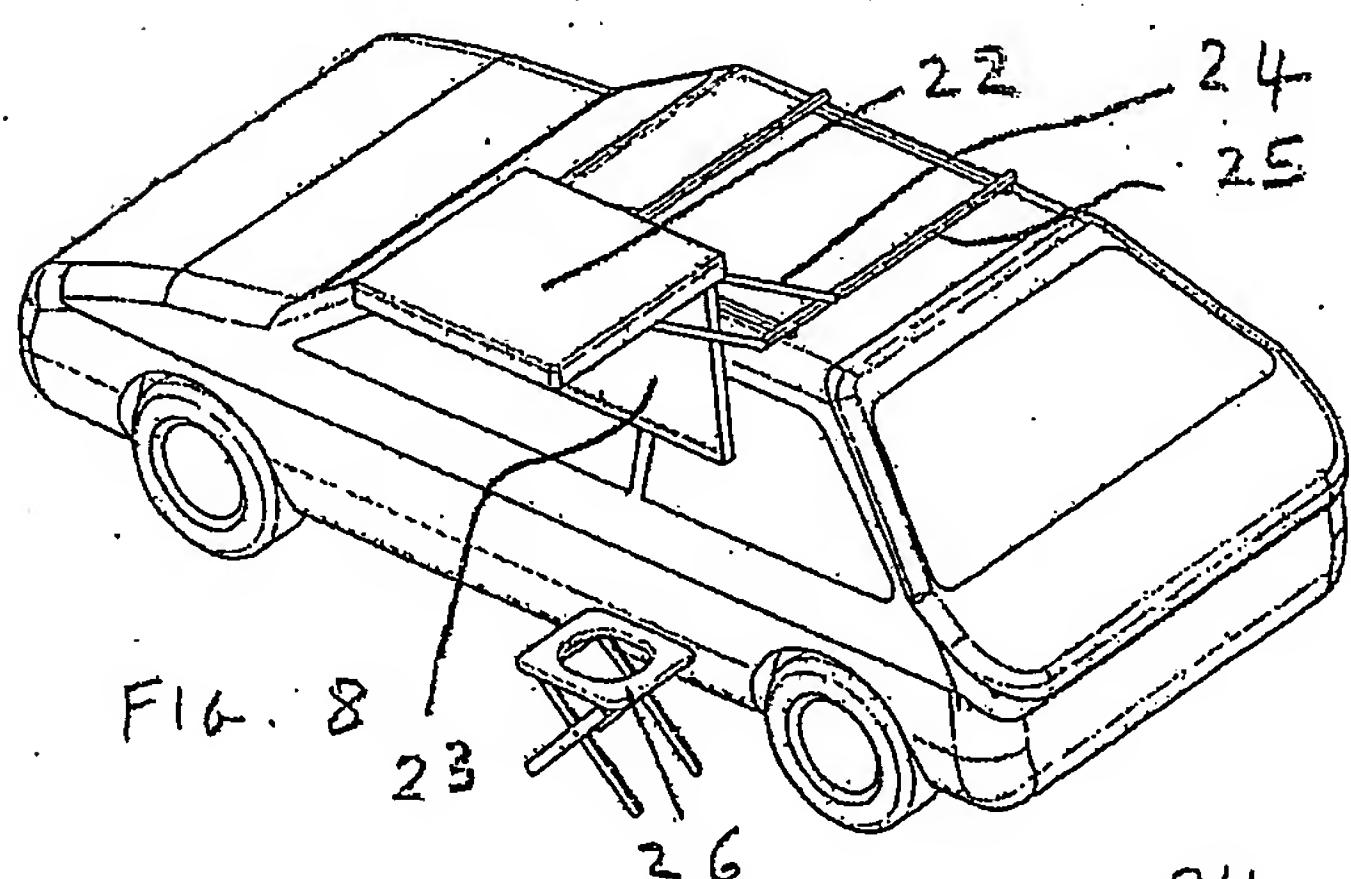
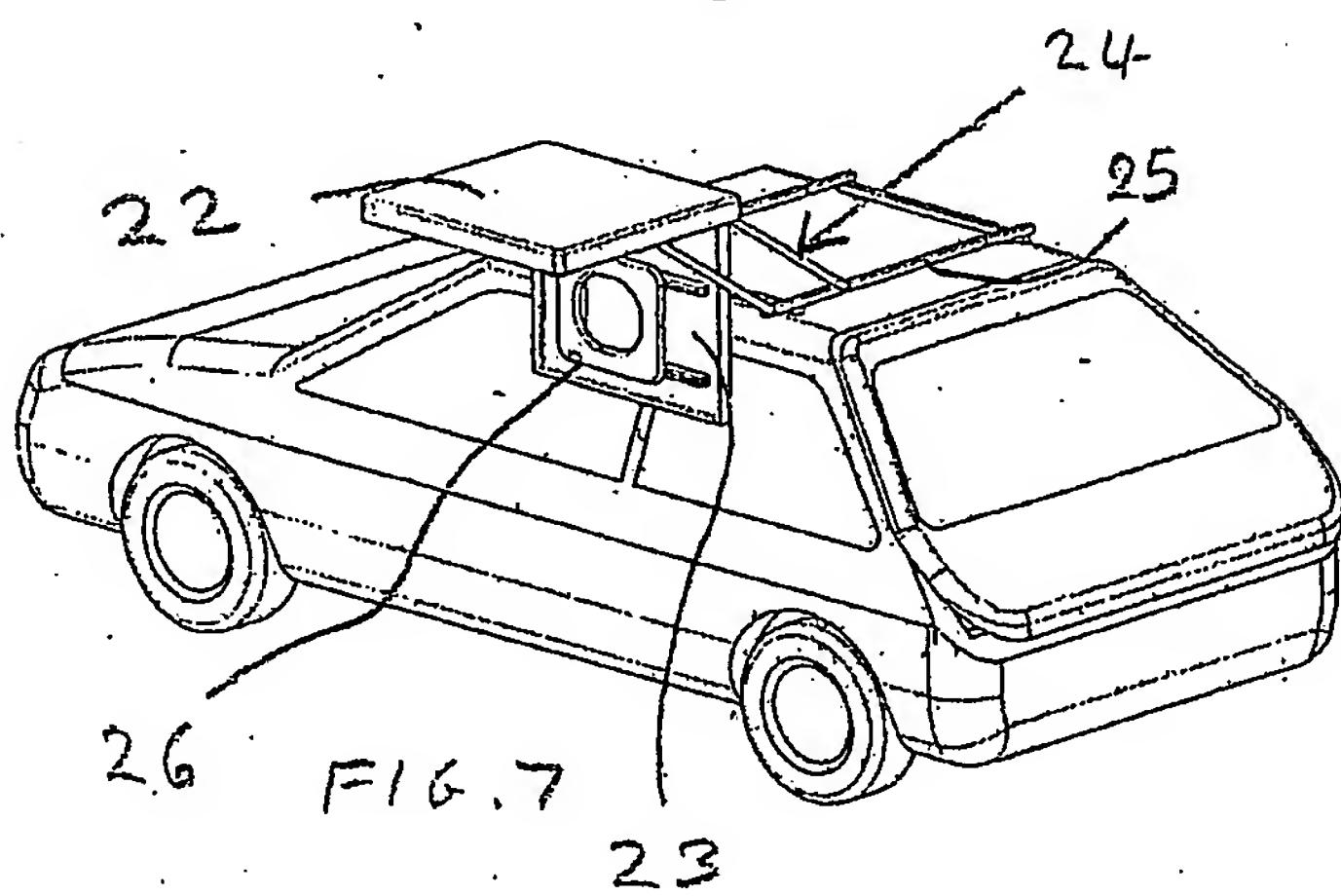
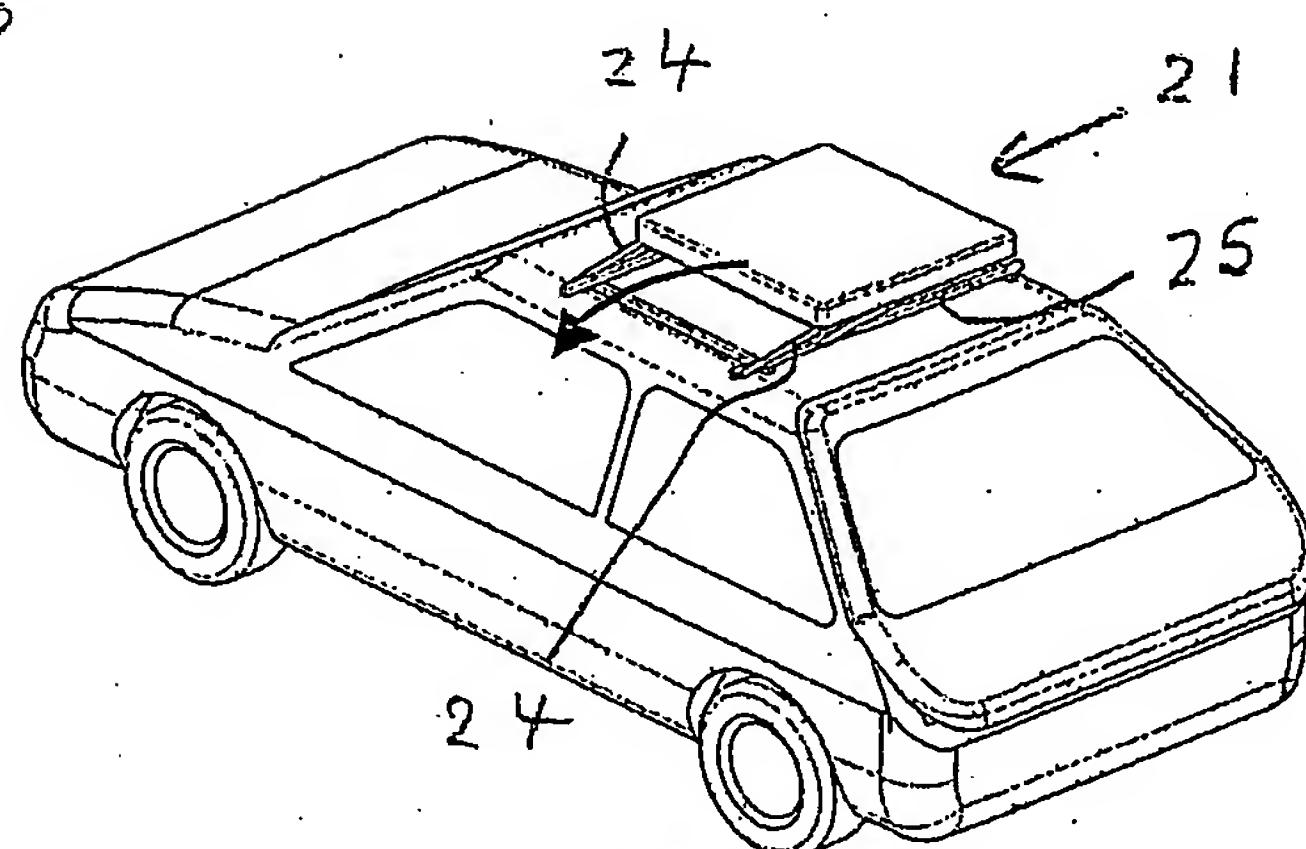
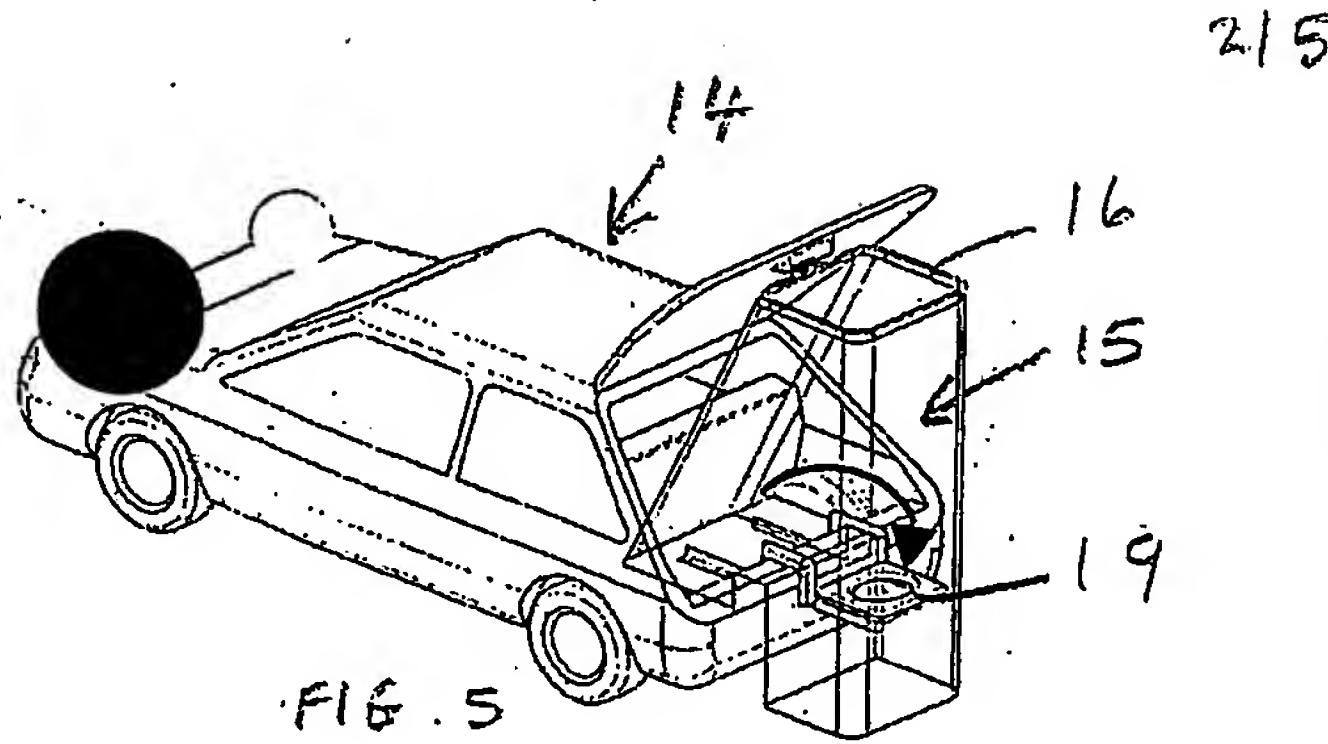
the assembly of the cubicle device 21 shown in Figures 6 to 10 would occur automatically.

Figures 23 and 24 show, in detail, a toilet seat 53 of the same form as the seats 26 and 50 shown in Figures 8 and 20 respectively. It can be seen that the seat 53 is of generally conventional pivoted folding form, but has an opening in its seat part 54. It is intended that this seat could be used with a biodegradable plastic bag 55 such as that shown in Figure 25. However if a user already has a suitable portable toilet unit, this could be used instead.

Figure 25 shows how the bag 55 is set up in the seat. No fixing is required. The proposed bags would be made from corn or maize starch and are compostable in approximately forty-five days. Preferably used bags are buried.

A particular advantage of the invention is that the cubicle allows a user space to stand up to prepare. This is considered to be much more convenient than prior art arrangements where the toilet has been provided wholly within a vehicle. Moreover a cubicle device of the invention can be used without a vehicle, for example as a free-standing unit for swimmers, surfers, etc. who need to change clothes in a public place. As far as the use of the cubicle device as a portable toilet is concerned, it is considered that the invention conveniently and efficiently meets the requirements set out in the introduction, particularly in relation to IBD sufferers.





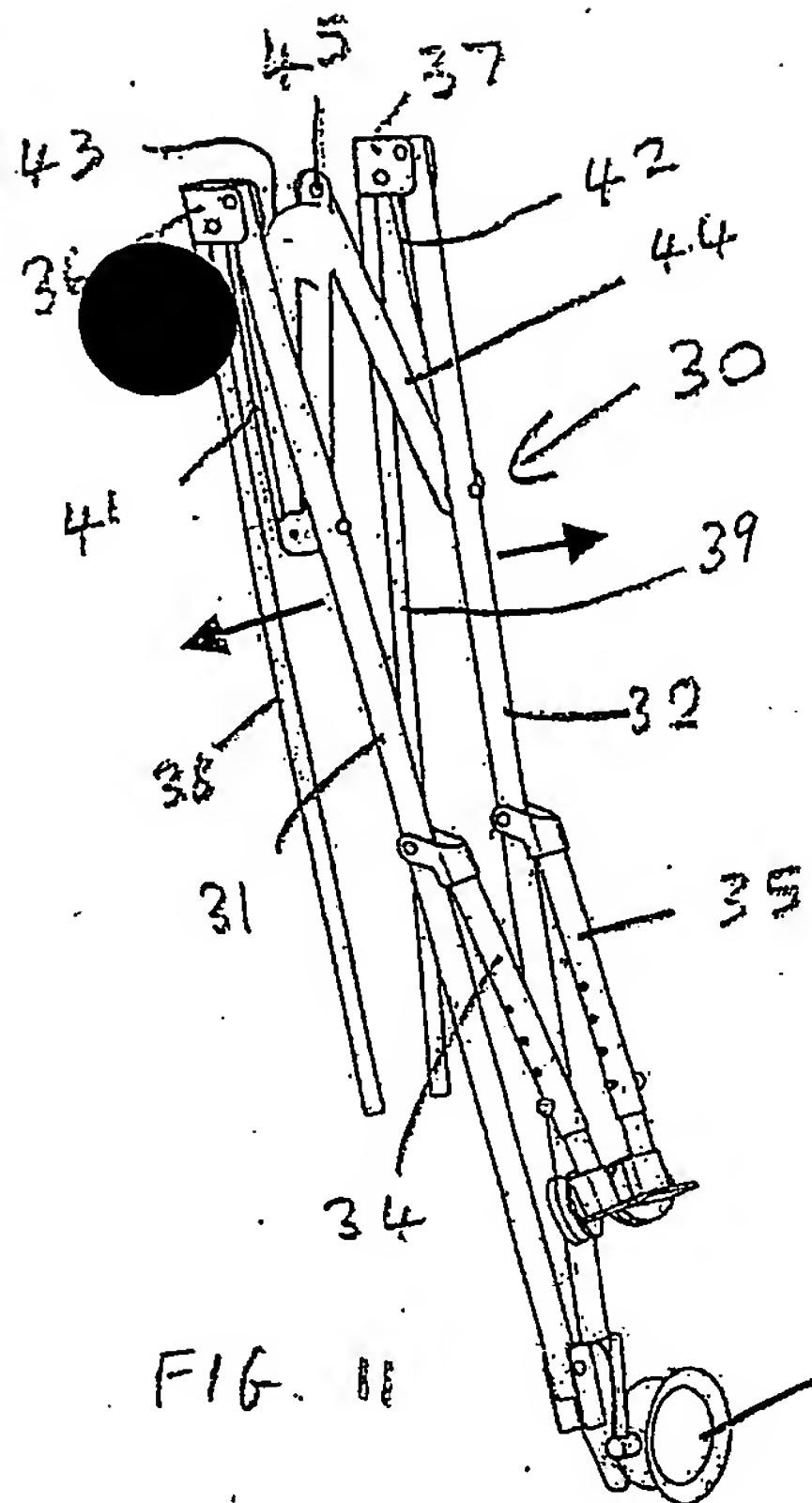


FIG. 11

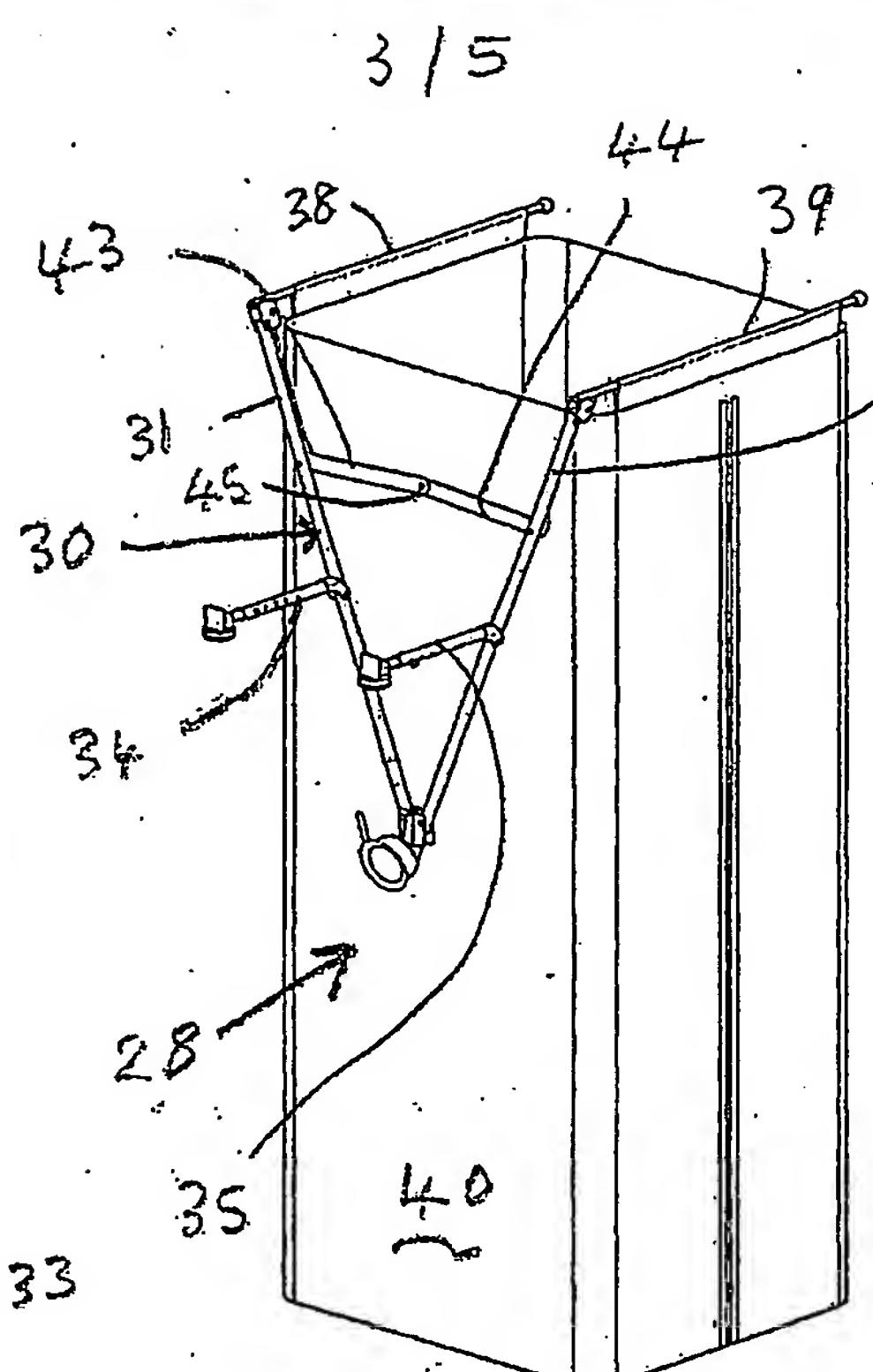


FIG. 12

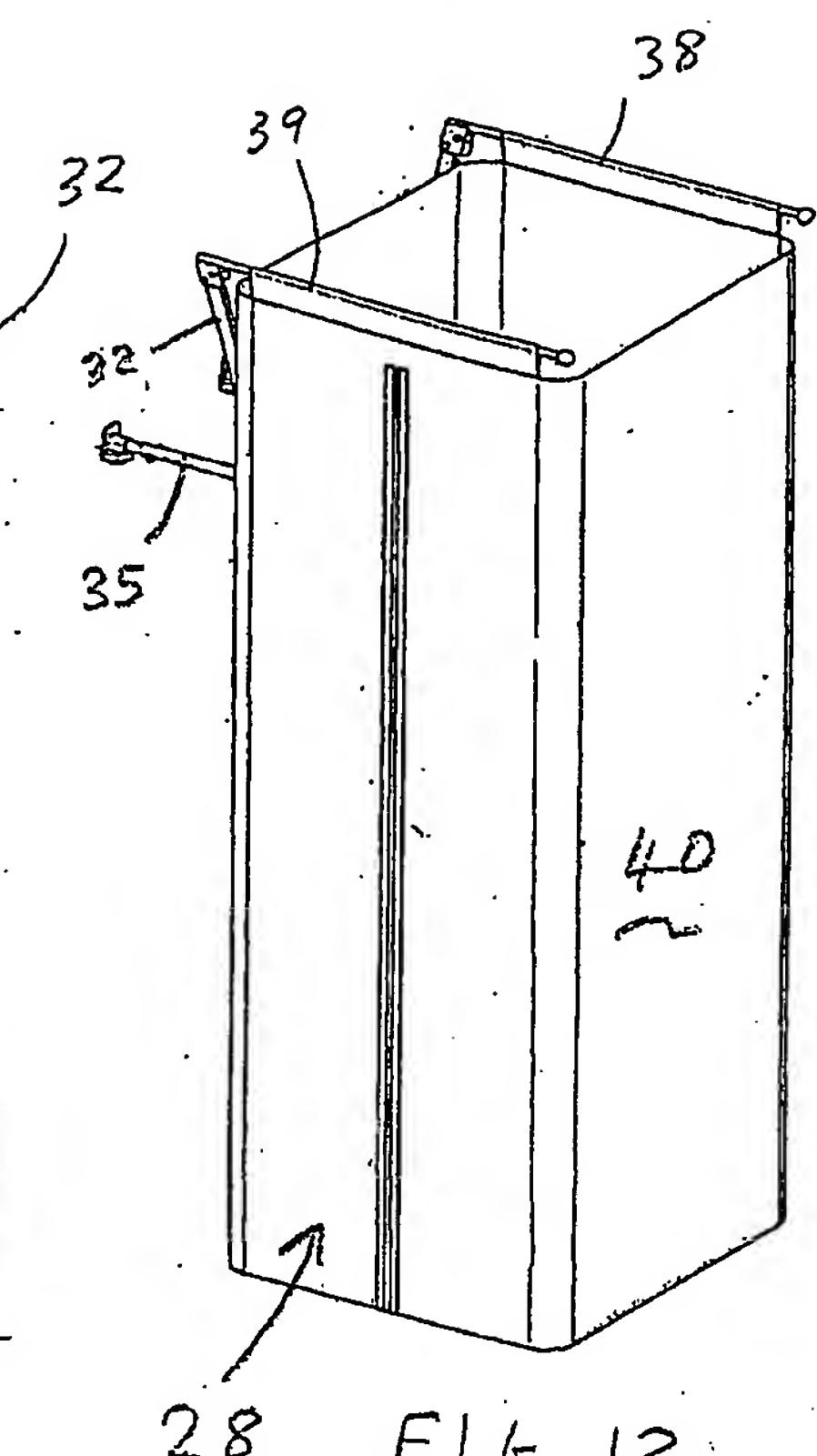


FIG. 13

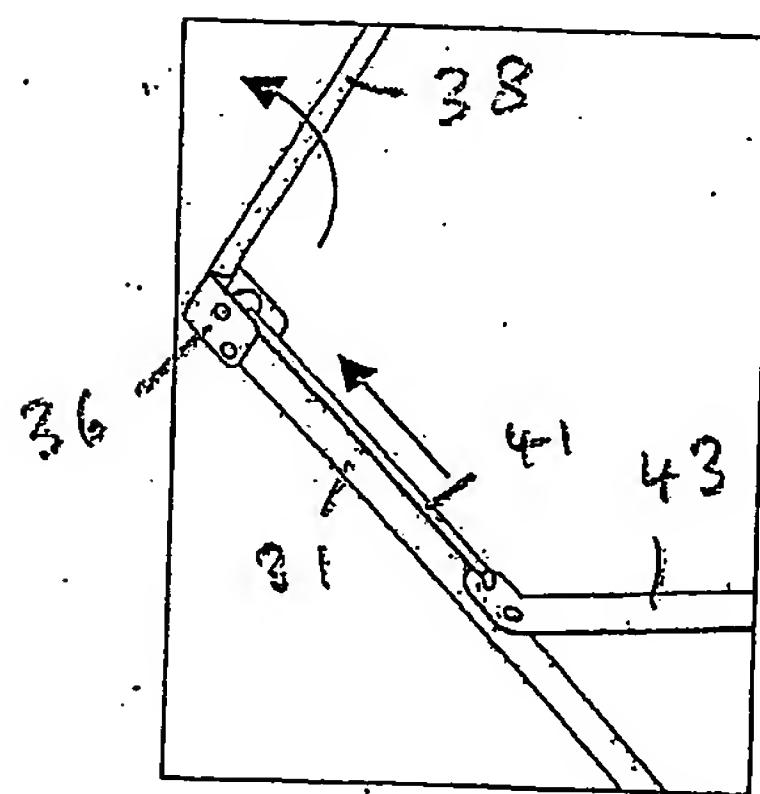


FIG. 14

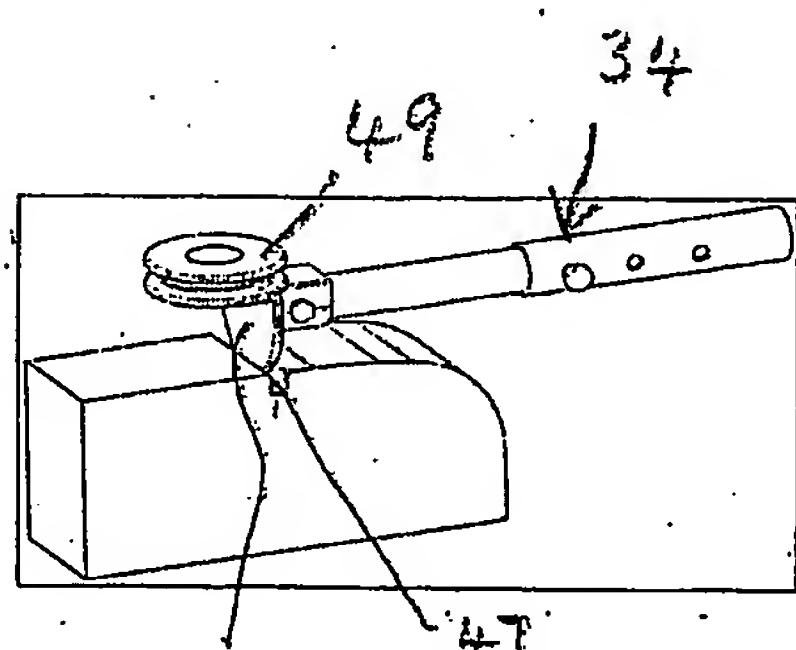


FIG. 15

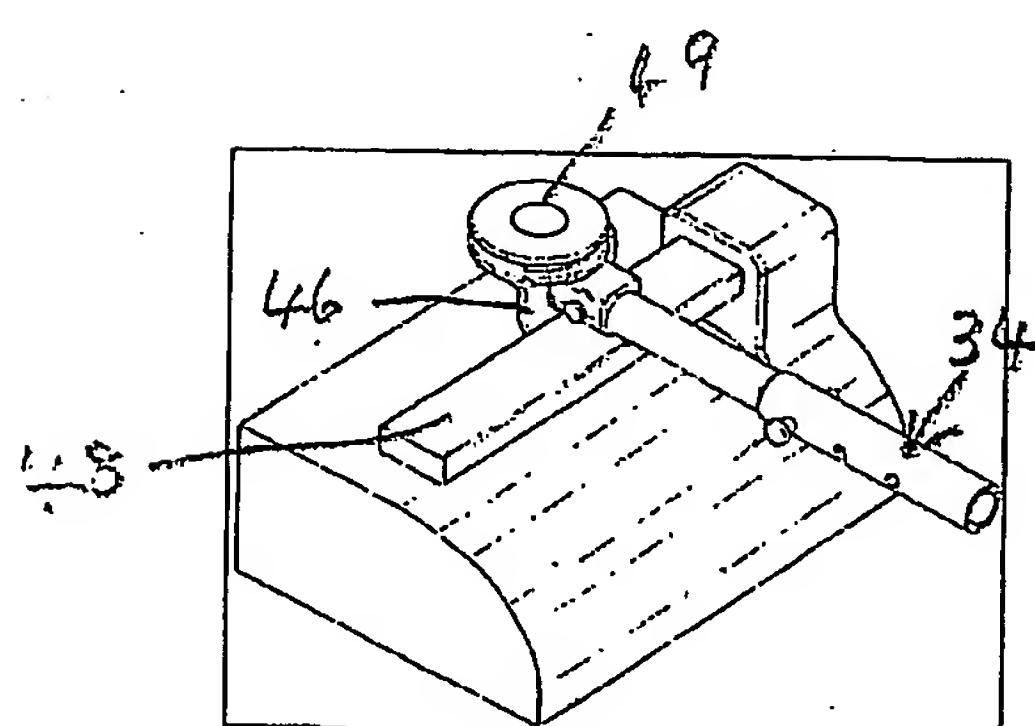


FIG. 16.

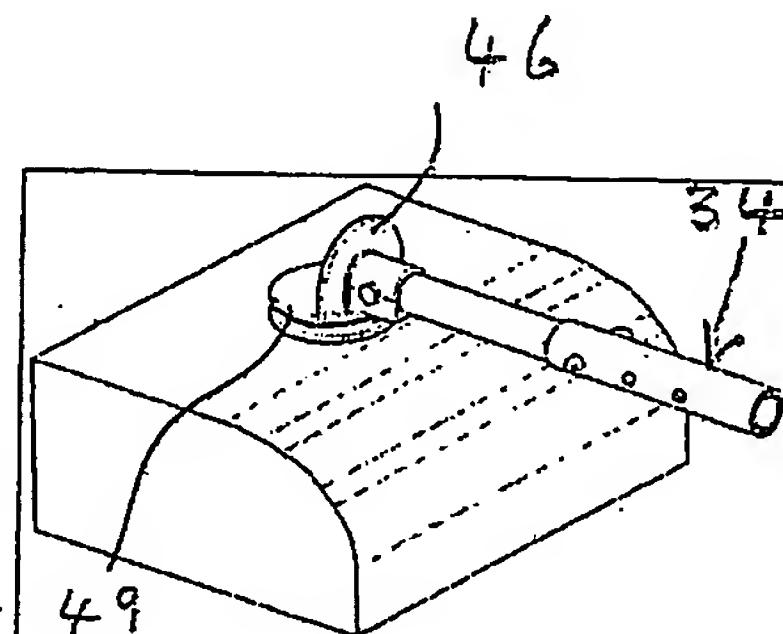
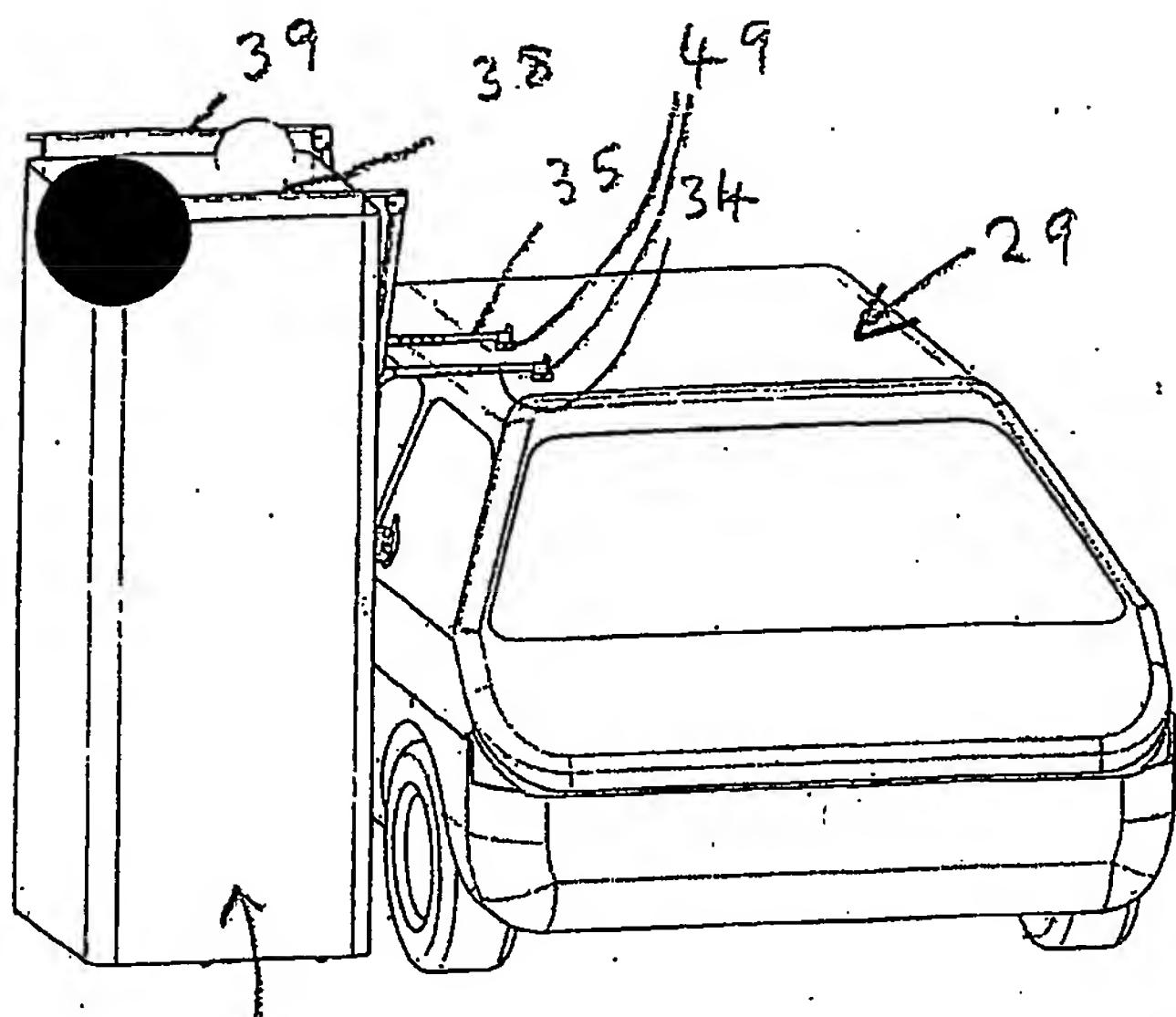


FIG. 17

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28 FIG. 18

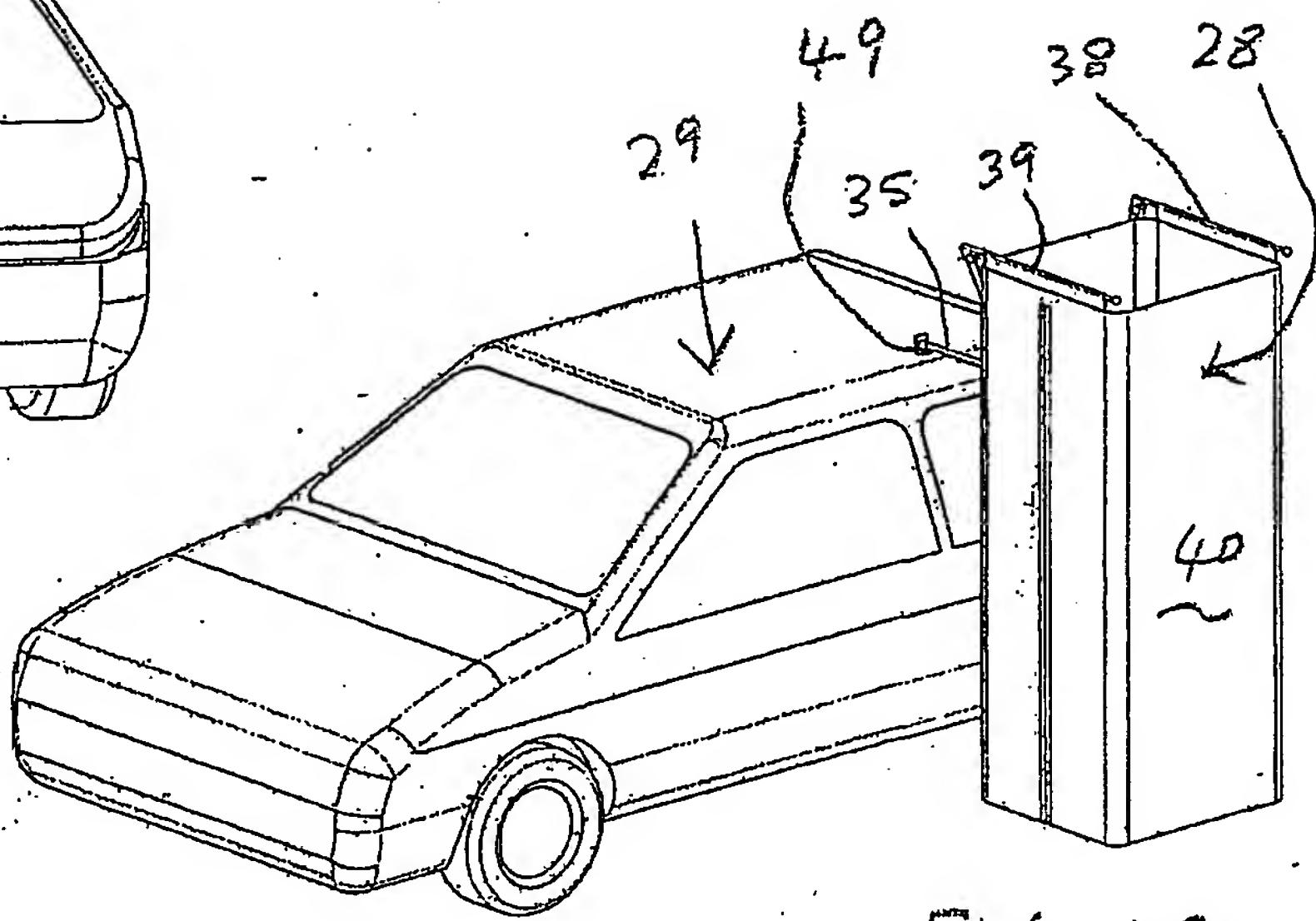


FIG. 19

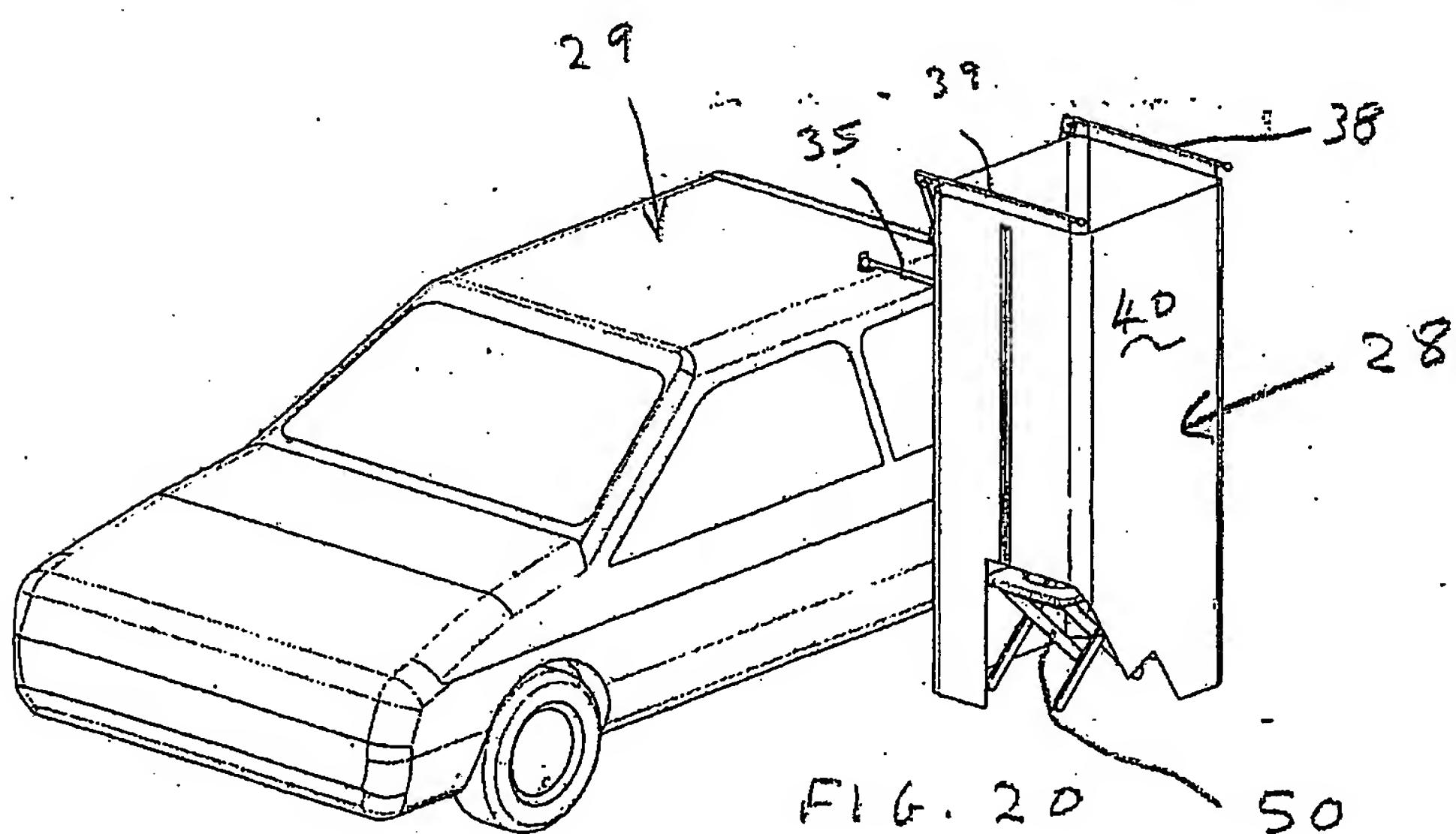
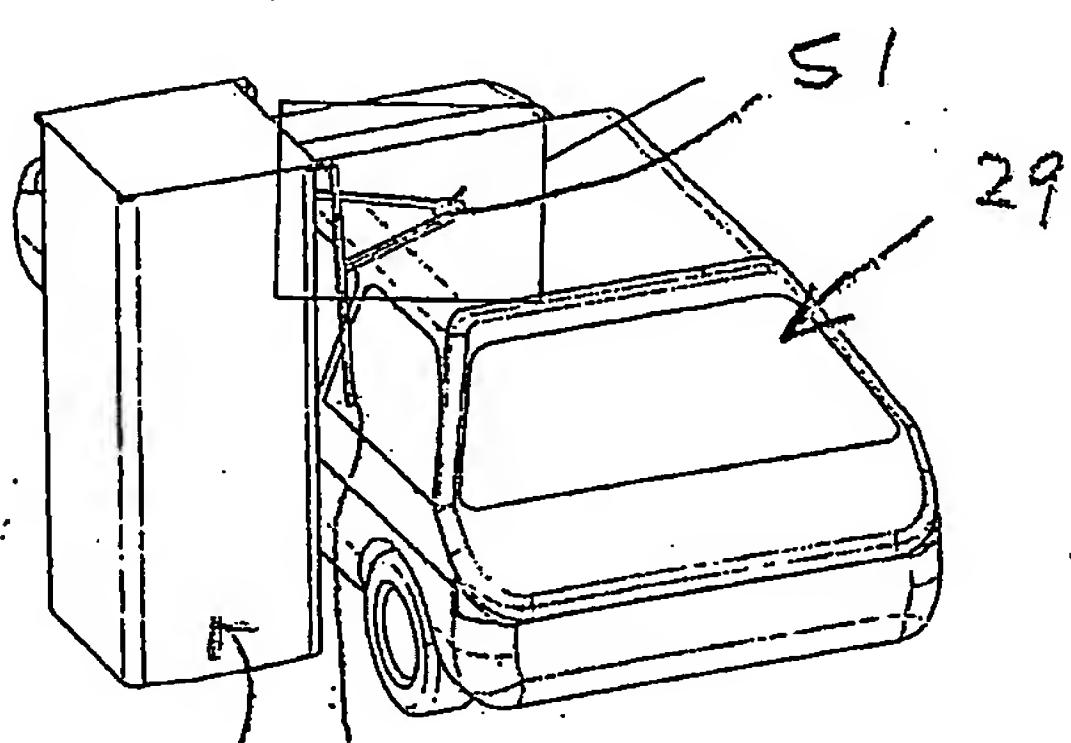


FIG. 20 50



28a 52 FIG. 21

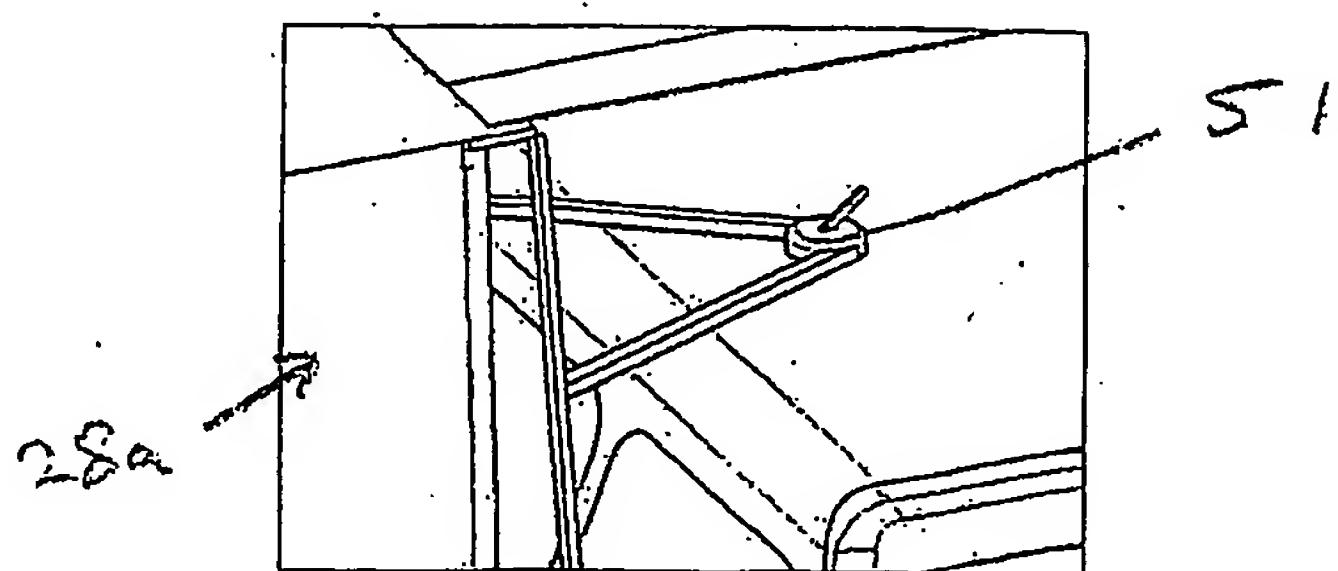


FIG. 22

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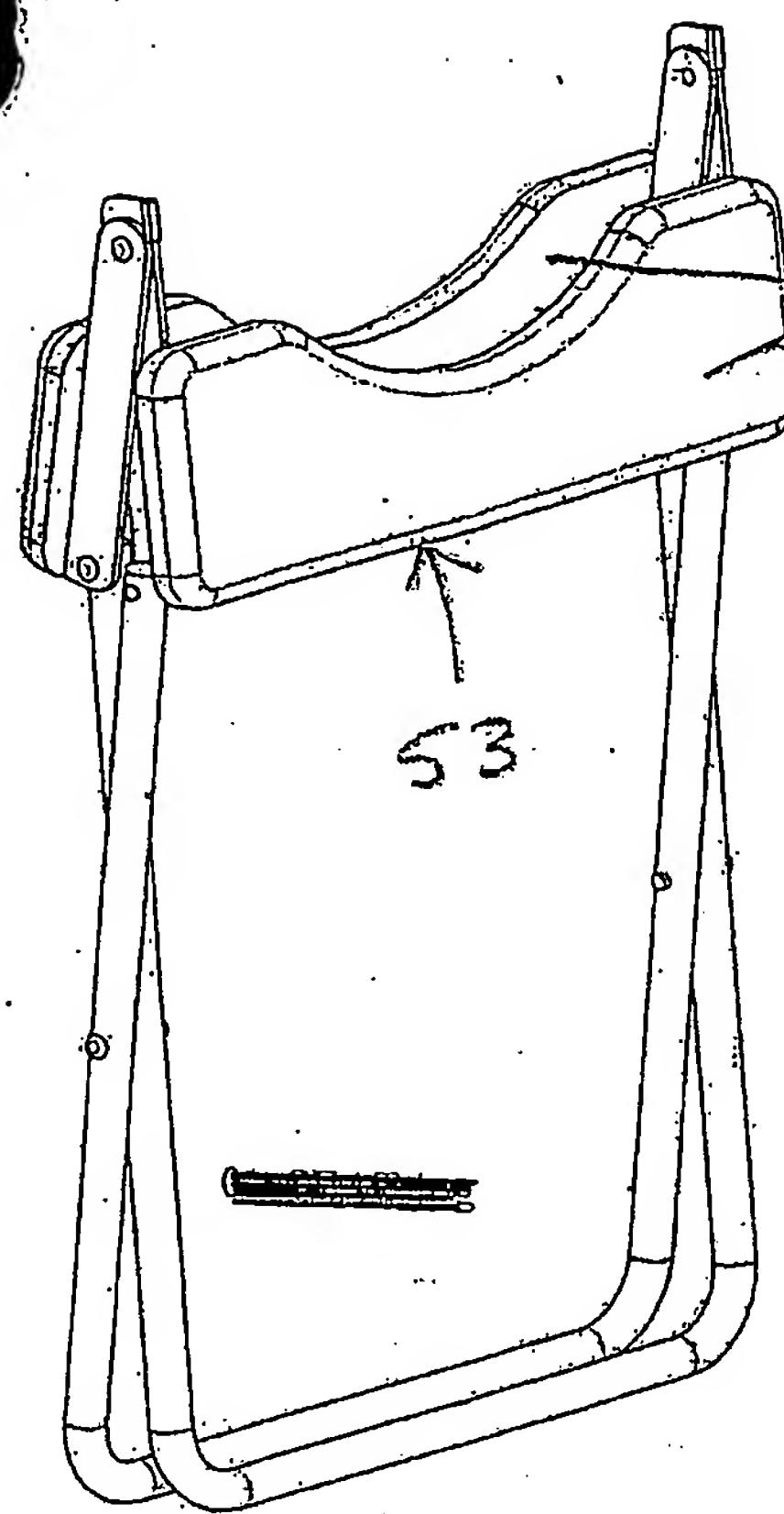


FIG. 23

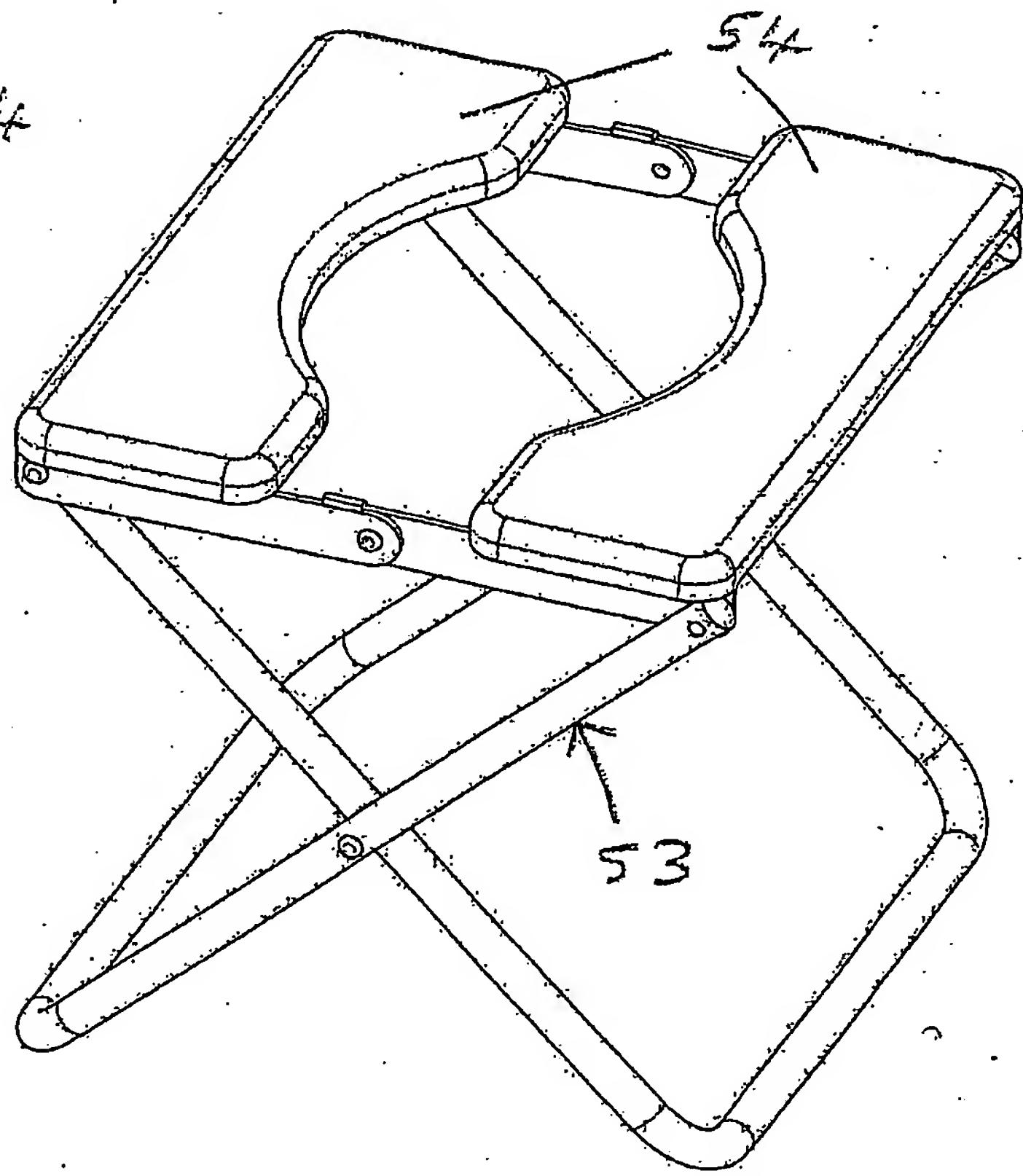


FIG. 24

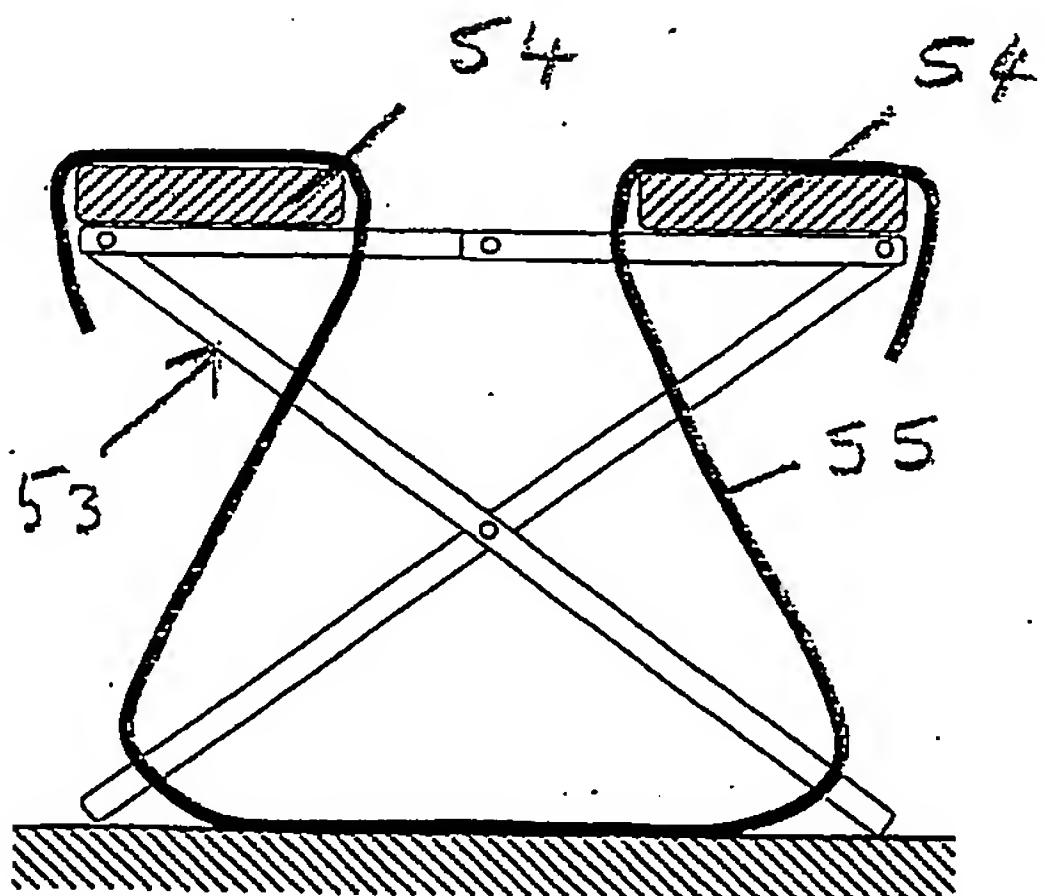


FIG. 25